ONLINE TOOLKIT
FOR DIGITAL CO-CREATION

belspo

BeCoDigital

Online toolkit for digital co-creation

This is toolkit is designed to help practitioners plan and implement co-creation initiatives involving citizens through digital technologies. It integrates the results and developments of the BeCoDigital research project jointly conducted by the University of Namur, KU Leuven, the University of Antwerp, and Sciensano.

WHAT IS CO-CREATION?

In this project we consider co-creation as defined by Torfing et al. (2019, p. 802):
"A process through which two or more public and private actors solve a shared problem, challenge or task through a constructive exchange of different kinds of knowledge, resources, competences and ideas that enhance the production of public value […] or services."

Discover real-life examples of co-creation

Corona Consulations

CartoWeb

How to navigate the toolkit?

We have organized this toolkit into 3 main sections. Each of these sections provides an overview of important elements, practical guidelines, outcomes of our study and representative examples.

Preconditions for digital co-creation	Mechanisms for digital co-creation	Outcomes of digital co-creation
What are individual motivations of citizens for participating in co-creation?	What are the existing methods and technologies co-creation I can use at each phase of co-creation?	What are the outcomes I can expect from a co-creation initiative and which outcomes matter to citizens?

You can navigate each of these sections independently be selecting them on the right or jump straight ahead to examples of co-creation.

You can jump to other pages by clicking on the dark blue buttons or reach consecutive pages like in any PDF. At any time, you can come back to this page by clicking on the house on the upper left corner

Preconditions for digital co-creation

This section provides an overview of important preconditions to consider when designing and commencing a co-creation project, from the participating citizens perspective. It identifies individual motivations for participation.

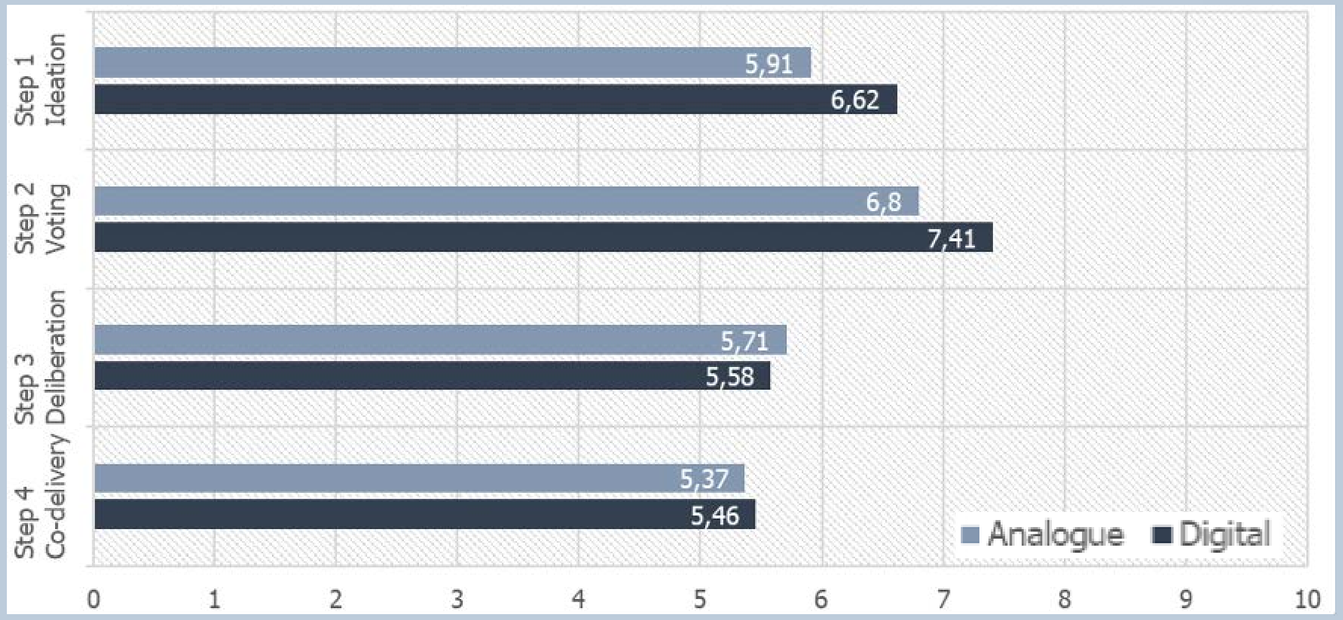
A wide variety of design choices can be made in its organization. For example, different participation methods, sequencing arrangements, logics about the level of autonomy and decision-making power, and digital tools might be considered to achieve particular objectives. All these design choices can affect the often attributed or ascribed benefits of digital co-creation.

When to use digital co-creation

Citizens preconditions for digital co-creation

When to use digital co-creation

Based on a experiment with 1,035 Belgian citizens, in some instances of co-creation (such as ideation and voting) the use of digital tools could be an interesting option to increase the willigness to particitpate. Hower, in others steps of the co-creation process (such as deliberation) it might seem redundant.



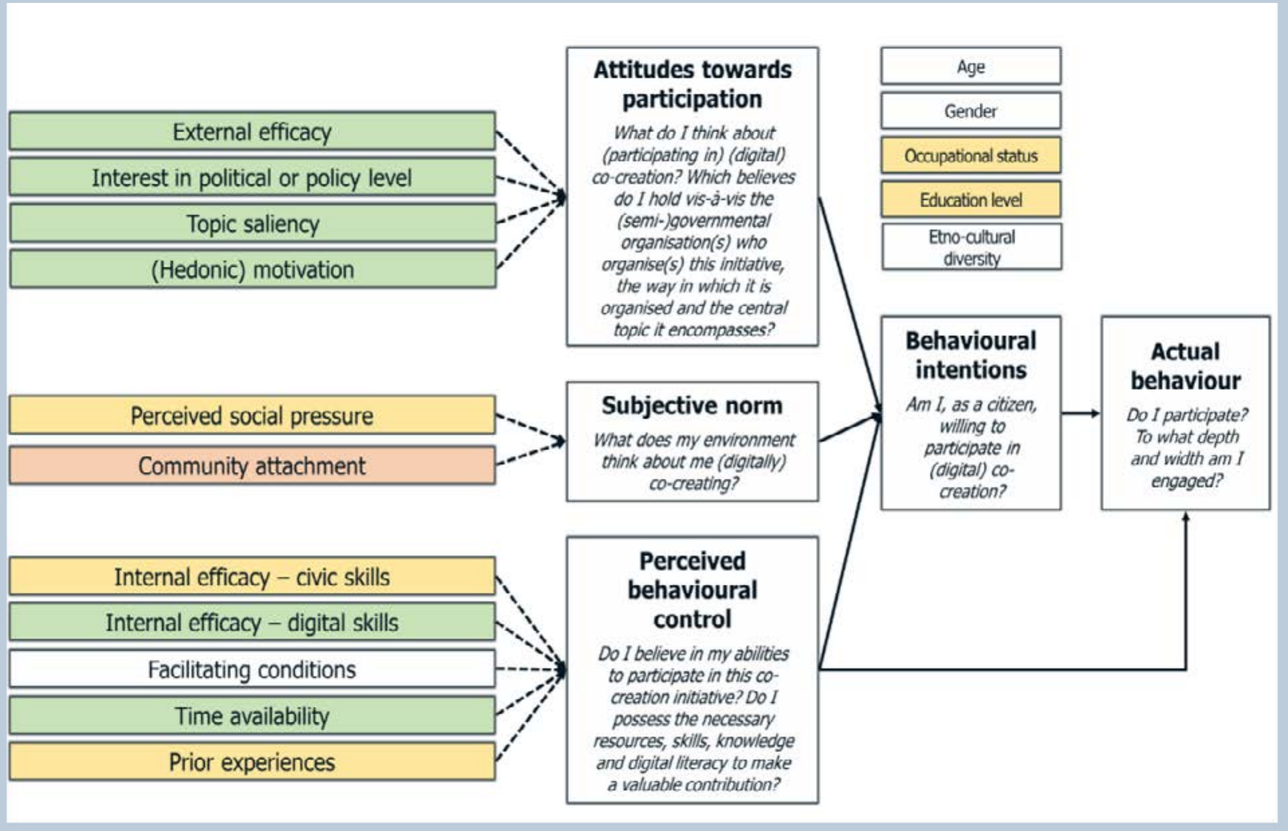
While digital options can lower the threshold for those Belgians who lack time to participate in co-creation, this effect appears not generally applicable and depends on the step or co-creation activity.

Citizen preconditions: to whom does digital matter?

Personal behavioral intentions will affect their will to participate in co-creation initiatives.

These intentions are shaped by **three beliefs**:
a. Attitudes toward participation
b. Pressure to partipate from one's social environment (subjective norm)
c. Perceived behavioral control

Each evaluative belief contains one or more preconditions that might affect citizens' intention to engage in digital co-creation.
Furthermore, also personal features, such as gender or one's employment status, can impact the behavioral intentions .



Green = positive influence
Orange = negative influence
Yellow = dependent on the co-creation step and the modality (digital, analogue or hybrid)

Citizen preconditions: Belgian study

1. Citizen demographics:

- Not active on the job market are significantly less likely to participate in deliberation and co-delivery
- Unemployement increases participation likeliness
- Highly educated people appear less willing to participate

2. Attitudes toward participation:

- The more one knows and is interested in politics, the more likely he or she will be to contribute
- Confidence in the usefulness of investing valuable time and effort in co-creation matters

3. Subjective norm:

- High levels of community attachment negatively associated with willingness to participate
- Perceived social pressure contributes positively to a willingness to engage in analogue co-creation steps

4. Perceived behavioral control:

- Believing in one’s ability to contribute effectively is important in ideation and voting activities
- Digital competences greatly determine willingness to co-create digitally

Citizen preconditions: What to do?

The pre-condition framework above can serve as a useful instrument to gauge citizens' willingness to digitally co-create. From an inclusivity point of view, we therefore recommend:

1. **To describe the targeted citizen audience(s):** Who do we really want to participate (for example, elderly people and their caretakers to reflect on the future of elderly care)? What specific demographical characteristics do these groups possess? How do these groups fare regarding the three sets of evaluative beliefs?

2. **To categorize the implications** when deploying digital, analogue, hybrid or mixed co-creation designs.

3. **To identify and list potential inclusion strategies** to circumvent or mitigate negative implications and inconveniences for the target audience.

4. **To rank and select the identified inclusion strategies** based on feasibility concerns and resources restrictions.

Mechanisms for digital co-creation

There are a wide range of offline and digital methods and technologies that can be used to support policy or service co-creation.

We review **8 co-creation methods**, presenting the co-creation phase in which they are best used, as well as pros and cons of each.

We present **4 types of technologies** that can implement co-creation methods, with examples of use in all co-creation phases.

We address the intricate challenge of combining co-creation methods by developing a **model visualization** that provides a visual way of representing co-creation initiatives. We illustrate it with a real-life case study.

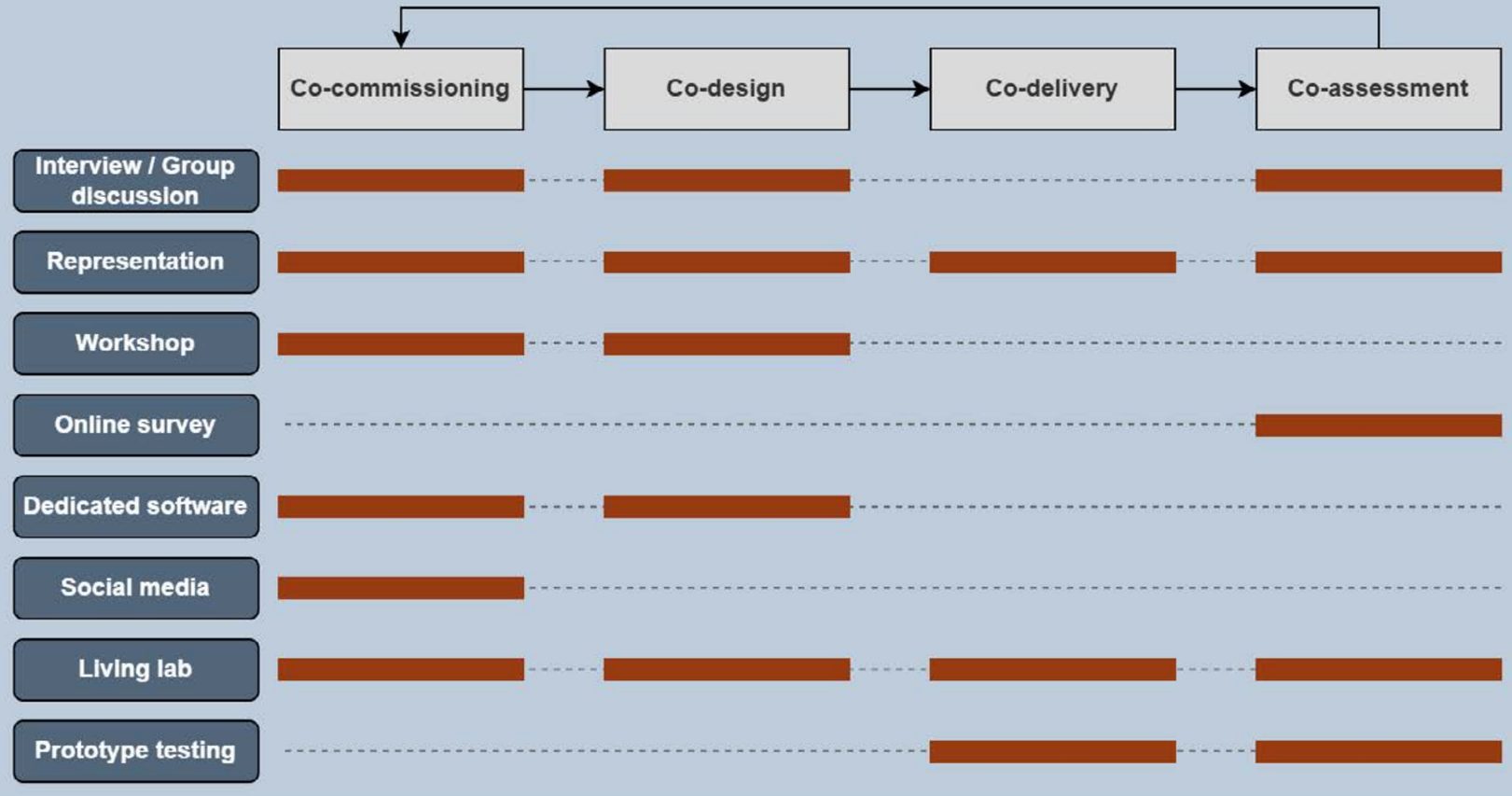
Explore co-creation methods

Explore technologies for co-creation

Discover the model visualization

Co-creation methods

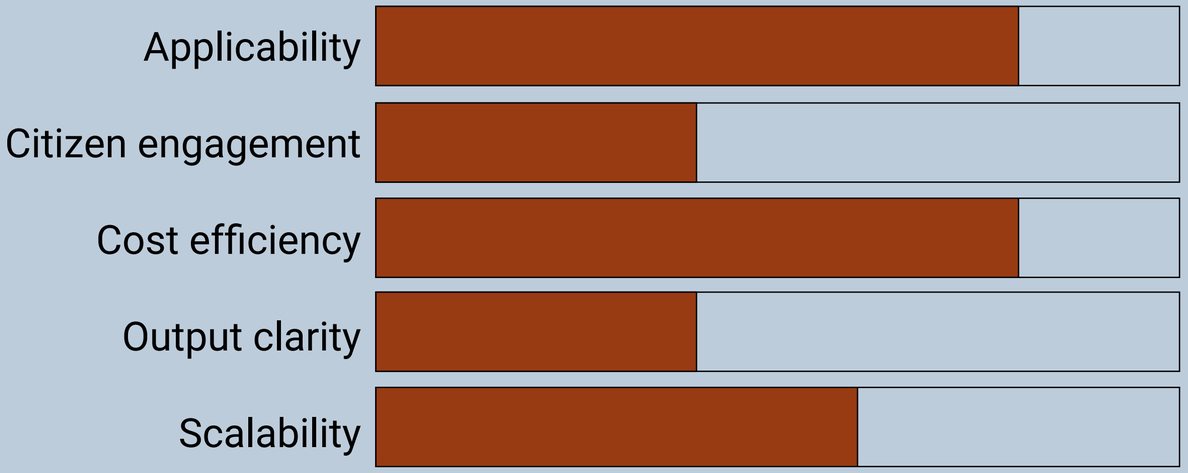
There are several **traditional** and **online methods** that can be used to co-create public services with stakeholders. Each method has its own advantages and disadvantages. Based on these characteristics we can pinpoint the co-creation phases that are the best match for each method. You can click on any method for a more detailed description.



Co-creation methods - Interview/Group discussion

Go back to the methods overview

Interviews and group discussions are two direct interaction methods frequently used to collect and refine requirements about a digital service. They are best used in the **co-commissioning**, **co-design**, and **co-assessment** phases.



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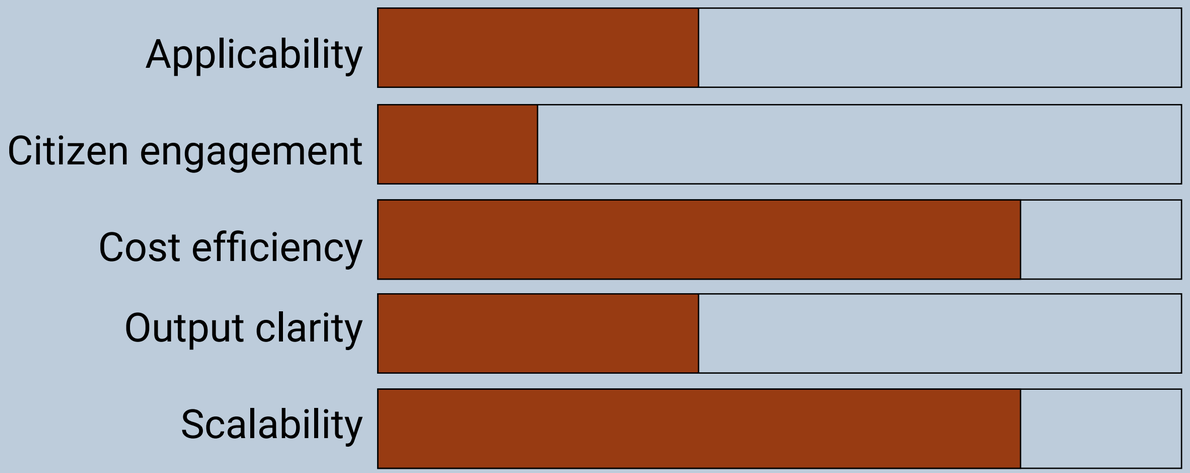
Interviews and group discussion can be used to involve citizens with impairements (e.g., visual) making them unable to participate through surveys.

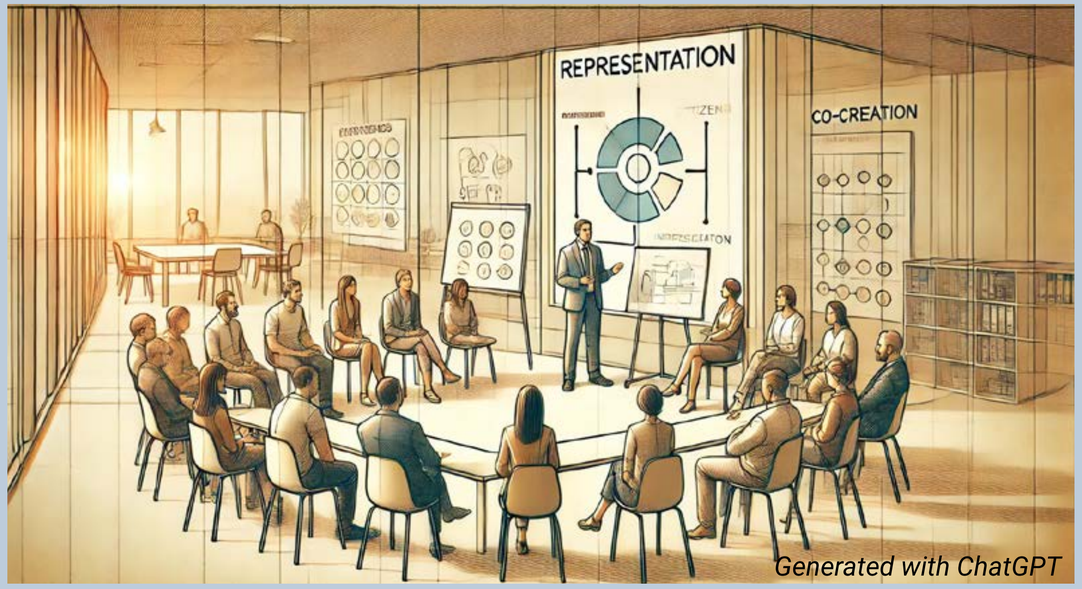
If the targeted citizens are too hard to reach, consider using **Representation**

Co-creation methods - Representation

Go back to the methods overview

Representation in the project team allows giving more influence to certain stakeholders, e.g., the end-users of the public service or the citizens affected by the policy. It is best used in the **co-commissioning**, **co-design**, **co-delivery** and **co-assessment** phases.





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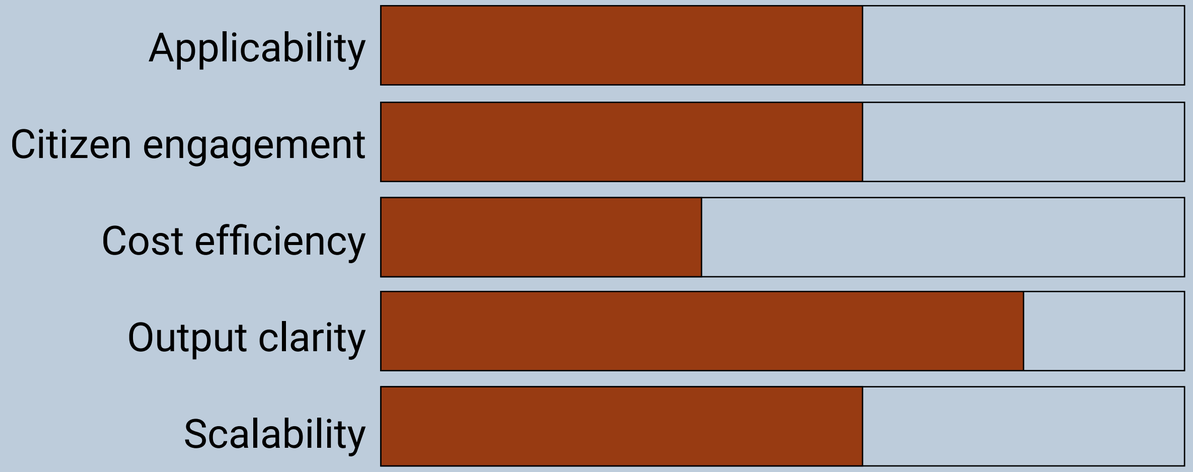
The representation method is specially interesting in the case of hard-to-reach stakeholders. However, the involvement demanded from the intermediaries is high. We recommend using the method in specific cases and selecting intermediaries that appear legitimate to the stakeholders they represent.

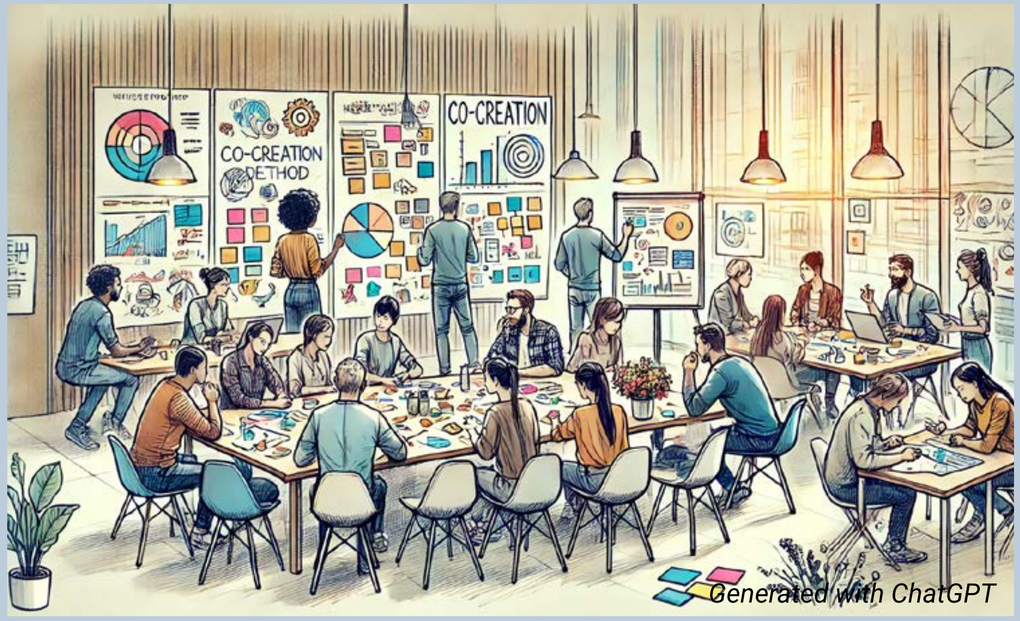
If stakeholders prefer a more direct involvement, consider using **Workshop**

Co-creation methods - Workshop

Go back to the methods overview

The organization of workshops is frequently used to collect and refine requirements. Once the problem to solve is clearly identified, workshops can also be used to design a service using brainstorming and voting mechanisms. They are best used in the **co-commissioning** and **co-design** phases.





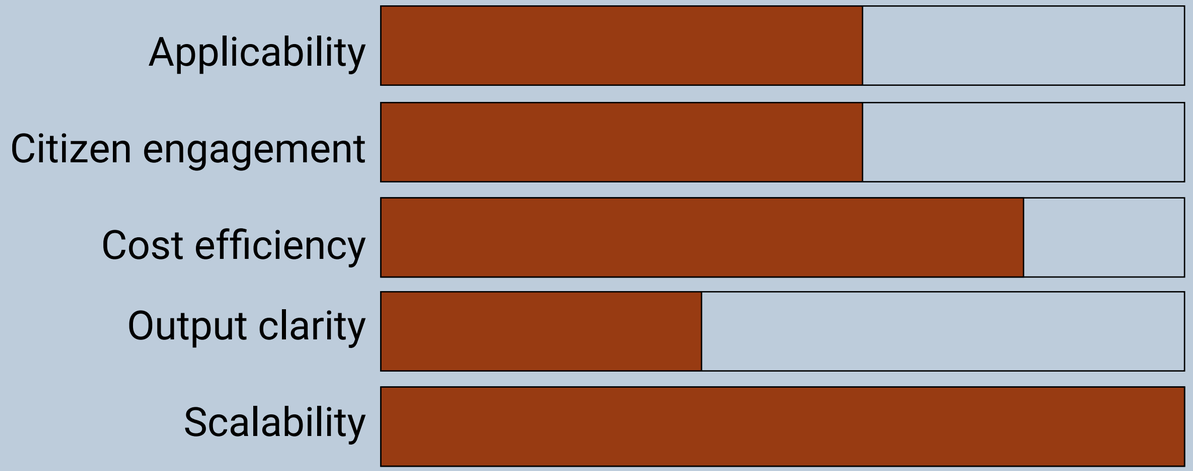
Workshops require stimulation through creativity techniques such as visualization tools or improvisation principles, but they also require facilitation, i.e., steering toward the targeted output of the workshop.

If workshops are too time-consuming to organize, consider using **Online survey**

Co-creation methods - Online survey

Go back to the methods overview

Online surveys allow stakeholders to participate asynchronously and remotely, removing logistical and planning barriers to participation. This method offers an opportunity for robust evaluation given its suitability for evaluations that require quantitative approaches.They are best used in the **co-assessment** phase.



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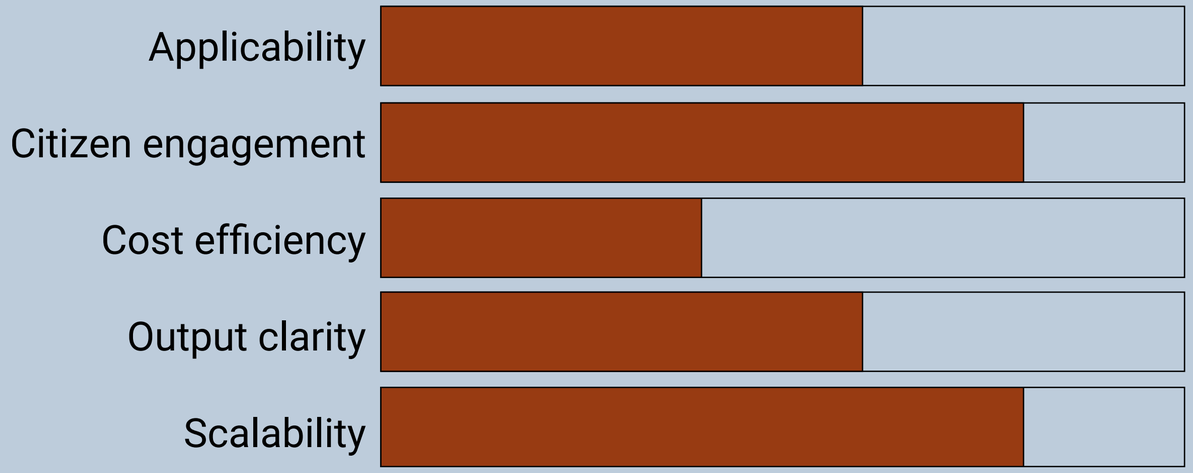
We recommend combining online surveys with a few interviews or group discussions to obtain richer insights into the figures obtained from the survey.

If more complex large-scale activities are required, consider using **Dedicated software**

Co-creation methods - Dedicated software

Go back to the methods overview

Dedicated software, such as crowsourced mapping tools or idea creation and deliberation tools, can be used to understand stakeholder's issues at a large scale. They are best used in the **co-commissioning** and **co-design** phases.



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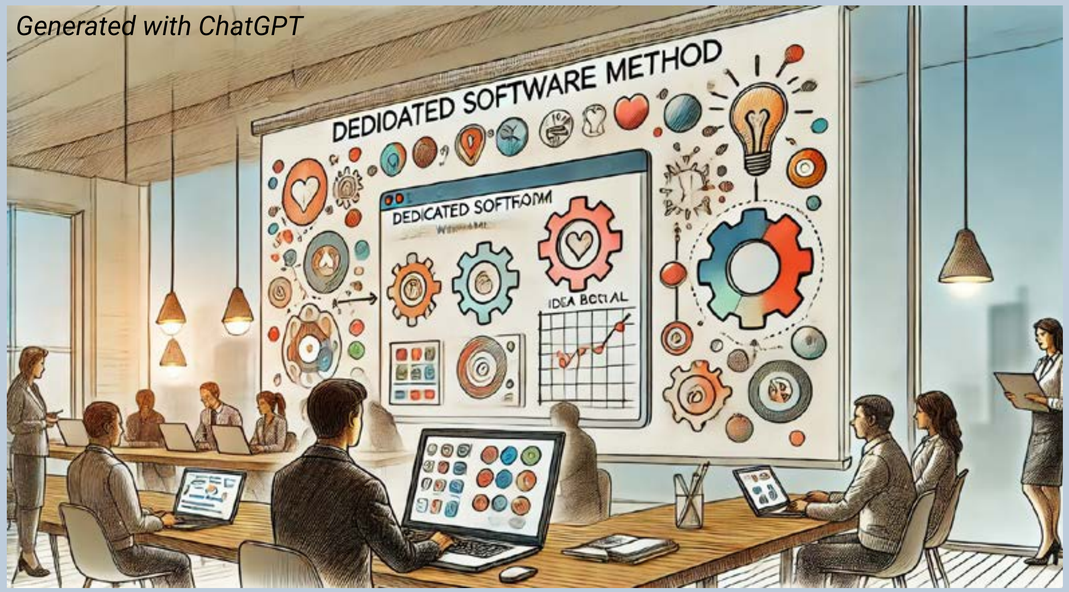


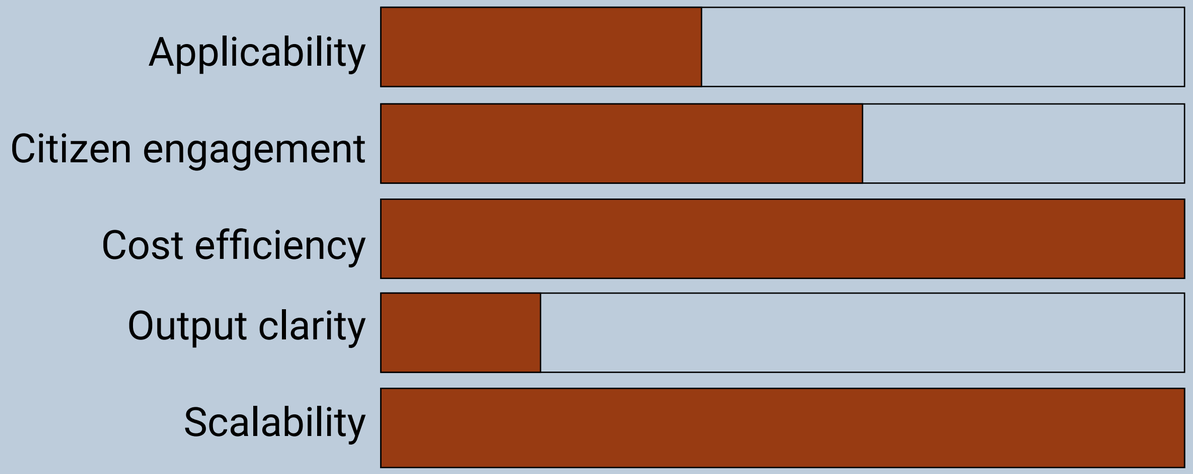
Dedicated platforms are among the most attractive co-creation channels for citizens. However, due to their high deploying cost we would recommend avoiding having too many platforms.

If costs are a significant constraint for the project, consider using **Social media**

Co-creation methods - Social media

Go back to the methods overview

Social media provides a convinient ecosystem to ask for citizens' input on a problem or a solution at a higher level or visibility and engagement than other methods. They are best used in the **co-commissioning** phase.



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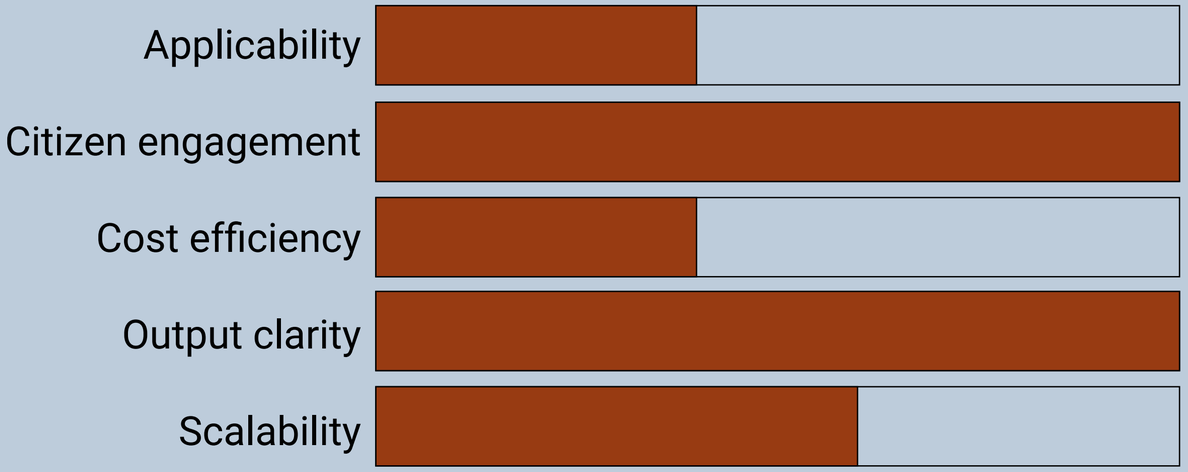
Due to the complexity of collecting valuable citizens' input on social media, we would recommend using it to issue very specific calls and to advertise calls for co-creation initiatives using other methods.

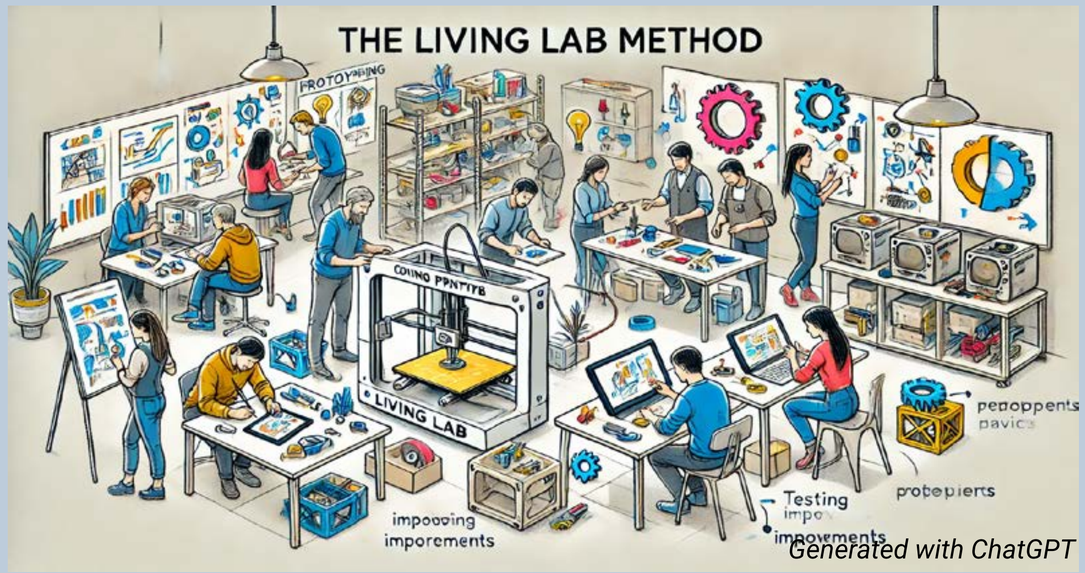
If more quality of inputs is desired, consider using **Dedicated software**

Co-creation methods - Living Lab

Go back to the methods overview

Living labs provide a collaborative space allowing multiple stakeholders to define problems, solutions, and experiment together in an iterative manner. They are best used in the **co-commissioning**, **co-design**, **co-delivery** and **co-assessment** phases.





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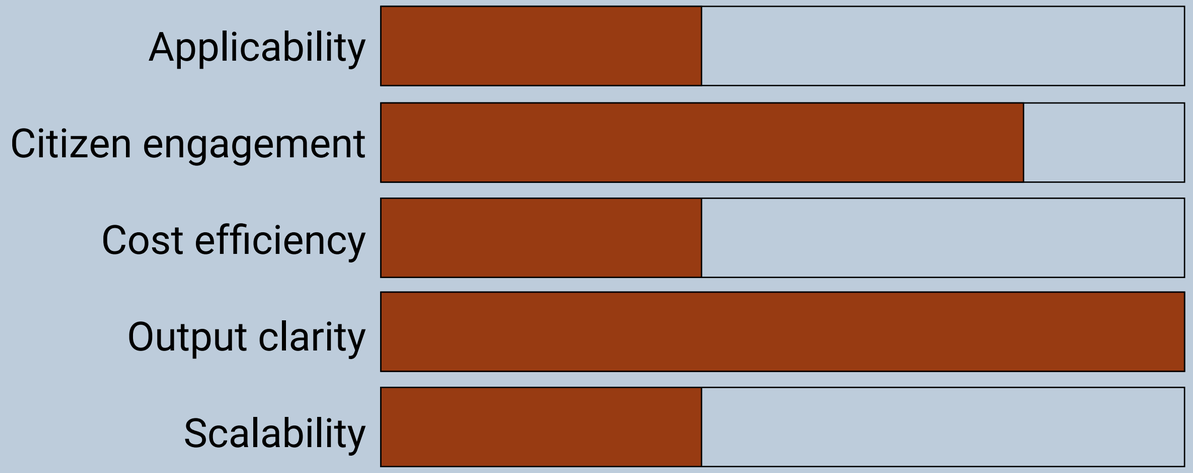
They require a physical infrastructure and the participation of stakeholders over a longer period. We would recommend using it in specific cases and if the infrastructure can be reused for other co-creation projects.

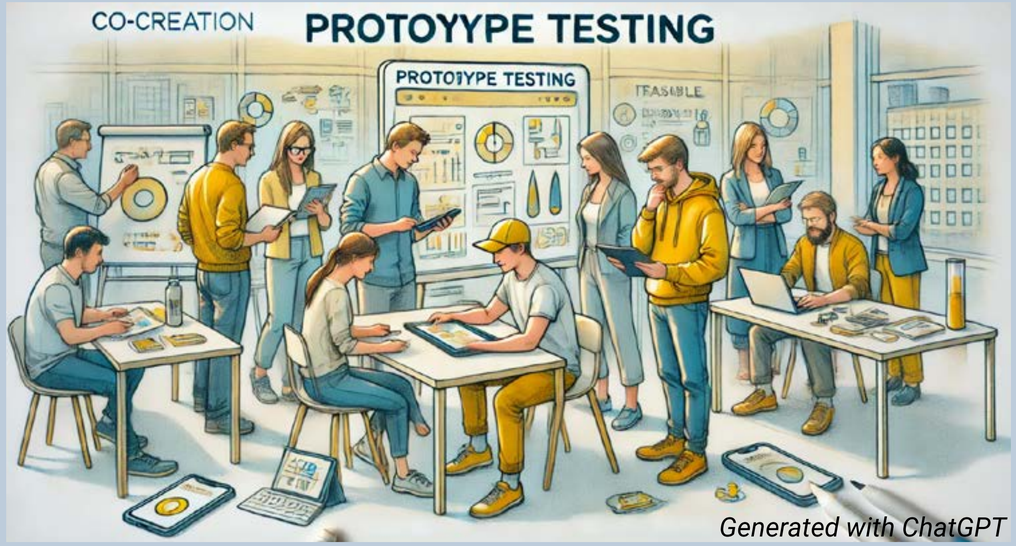
If is hard to keep enough stakeholders over a long period, consider coupling with **Representation**

Co-creation methods - Prototype testing

Go back to the methods overview

Prototyping is a method used to present an unfinished service to its potential end-users. It is highly efficient to support an iterative co-creation process, in which the co-assessment of a prototype feeds insights into a subsequent co-commissioning stage. It is best used in the **co-delivery** and **co-assessment** phases.





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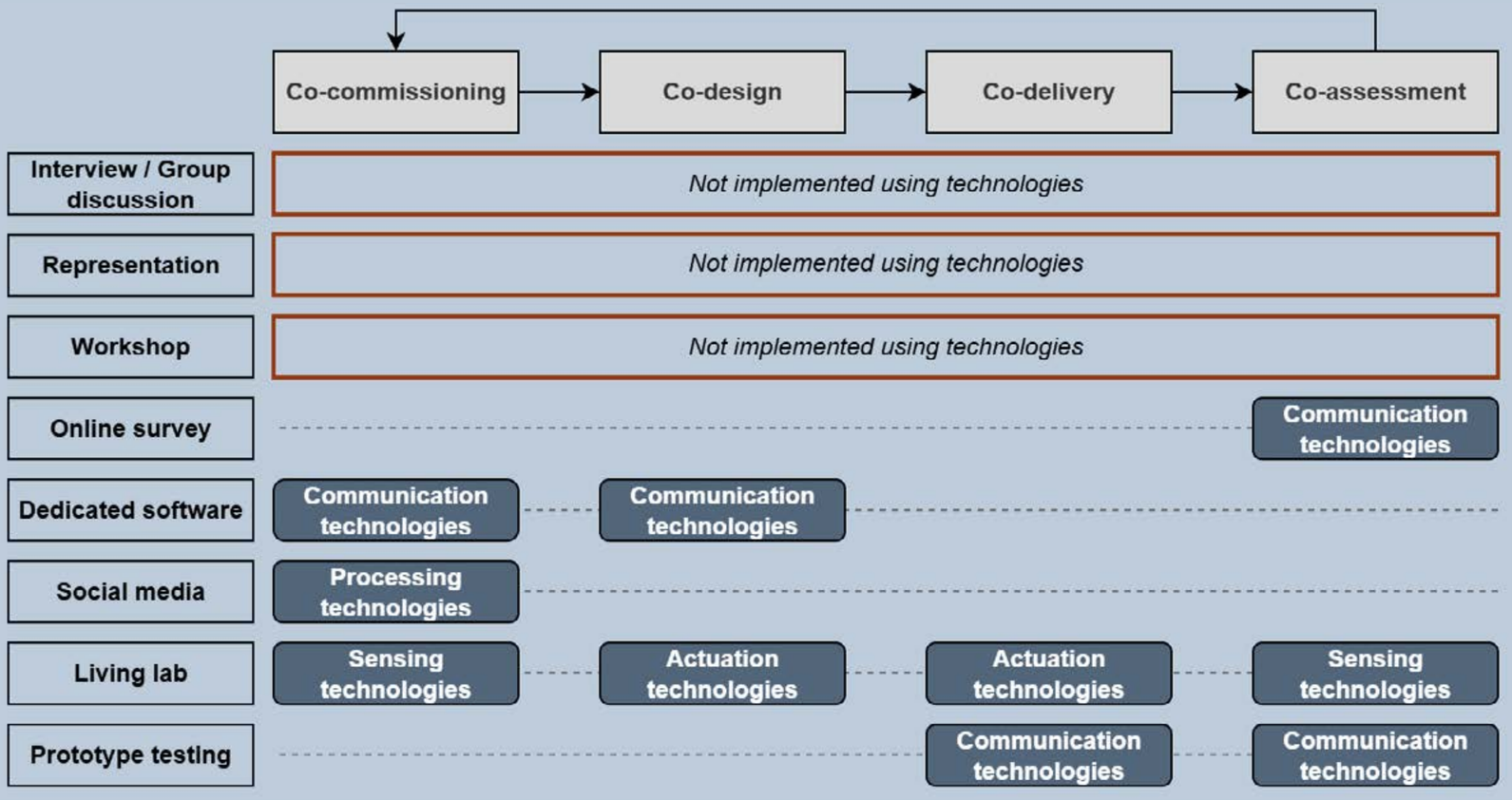
We would recommend aiming for rapid iterations of prototype testing and refinement, keeping more robust evaluation approaches for more mature prototypes.

If simpler evaluation might be sufficient, consider using **Online survey**

Technologies for co-creation

In order to implement the co-creation methods, a range of different technologies can be used. We describe **four general types of technologies** and provide examples on how they can implement a given method within each co-creation phase that we identified as a good match for the method. The presented examples have successful implementation reported in the scientific literature, but possible uses go beyond. You can click on any technology for a more detailed overview.



Technologies, just as methods, can be used alone or in combination with others
Explore the Healthy Data Project case example to see how communication technologies are used and could be combined with processing technologies

Explore the Healthy Data Project case

Technologies for co-creation - Sensing technologies

Go back to the technologies overview

Sensor technologies refer to smart or wearable devices that make it possible for citizens to collect data (e.g., on the environment) in a new way. It can be used in the **co-commissioning** and **co-assessment** phases.

In the **co-commissioning** phase, sensor technologies can be used to diagnose a problem with objective data collected in the envirionment. This ensures that all stakeholders discuss on the same knowledge base.
In the **co-assessment** phrase, sensor technologies can be used to collect data from the environment to evaluate in an objective and collaborative way the impact of a service or a policy.

Sensor technologies are relevant when an impact on the physical environment is sought.

If a deployment of sensing technologies is not possible, consider using interviews/group discussions or online surveys enabled through

Communication technologies

Technologies for co-creation - Communication technologies

Go back to the technologies overview

Communication technologies enable machine-mediated interaction between the organizers of the co-creation initiative and citizens. Some technologies are already fairly integrated in practice, such as social media and videoconferencing tools, but new and dedicated tools can be created. Communication technologies can be used in the **co-commissioning**, **co-design**, **co-delivery** and **co-assessment** phases.

In the **co-commissioning** and **co-design** phases, communication technologies can be used to ask citizens about the services they want in priority and to get their input on which design the service should implement.

In the **co-delivery** and **co-assessment** phases, communication technologies can be used to interact with citizens for feedback while developing the service iteratively, and to get their input on their perception of the service's impact once deployed.

If citizens' input is too voluminous, consider coupling with **Processing technologies**

Technologies for co-creation - Processing technologies

Go back to the technologies overview

Processing technologies help to make sense of large quantities of data. They encompass big data and machine learning techniques as well as tools that support interactive data exploration through visualization and filtering. Processing technologies can be used in the co-commissioning phase.

The **co-commissioning** phase usually involves the collection of inputs from citizens to frame the problem that the service will solve. This input can be voluminous and/or unstructured, thus difficult to make sense of manually. Techniques such as topic modeling can be used to understand the discussion areas of a large set of citizens' inputs.

If it is relevant to go back to citizens for further input on the result of processing, consider coupling with

Communication technologies

Technologies for co-creation - Actuation technologies

Go back to the technologies overview

Actuation technologies can perform physical actions independently from a human, even though its sequence of actions might have been programmed by a human. Examples include robots and 3D printers. Actuation technologies can be used in the **co-design** and **co-delivery** phases.

Actuation are more rarely used in co-creation initiative but provide opportunities when the service has a physical component (e.g., a voting service involving a physical case with buttons). In such a case, prototyping technologies such as 3D-printers can be used to compare design alternatives and produce working prototypes in the **co-design** and **co-delivery** phases. Unlike other technologies, this allow citizens to have a physical interaction with the service before its deployment.

Model visualization

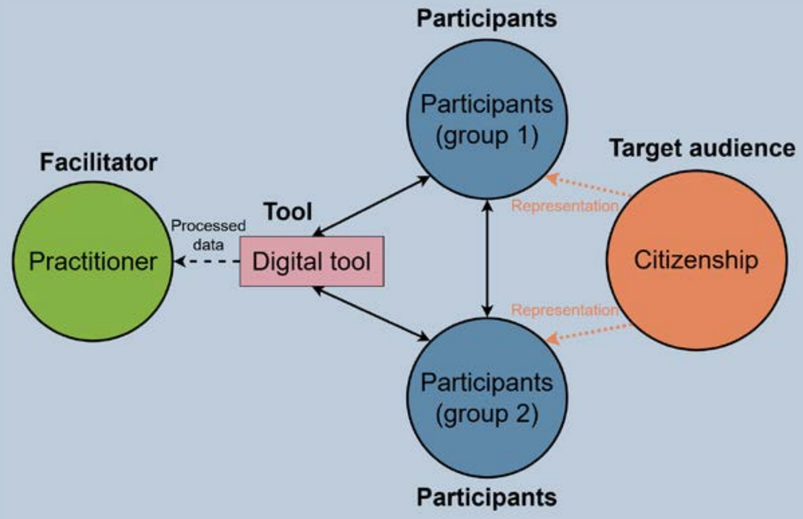
Each co-creation method has its strengths and weaknesses. For exemple, social media have high cost efficiency but lack a clear quality output, while workshops are more costly to organize but achieve much clearer outputs with a more active involvement of citizens.

No single method is the silver bullet of co-creation, the best results are achieved by combining methods. This demands a good characterization of all elements involved in the implementation of the different methods.

To ease the comparison and combination of methods we developed a **model visualization** presenting co-creation initiatives as graphs

- Nodes depict target audience, participants, facilitators, platforms
- Edges depict communication, action, representation

Below is a generic representation of a co-creation initiative using the model



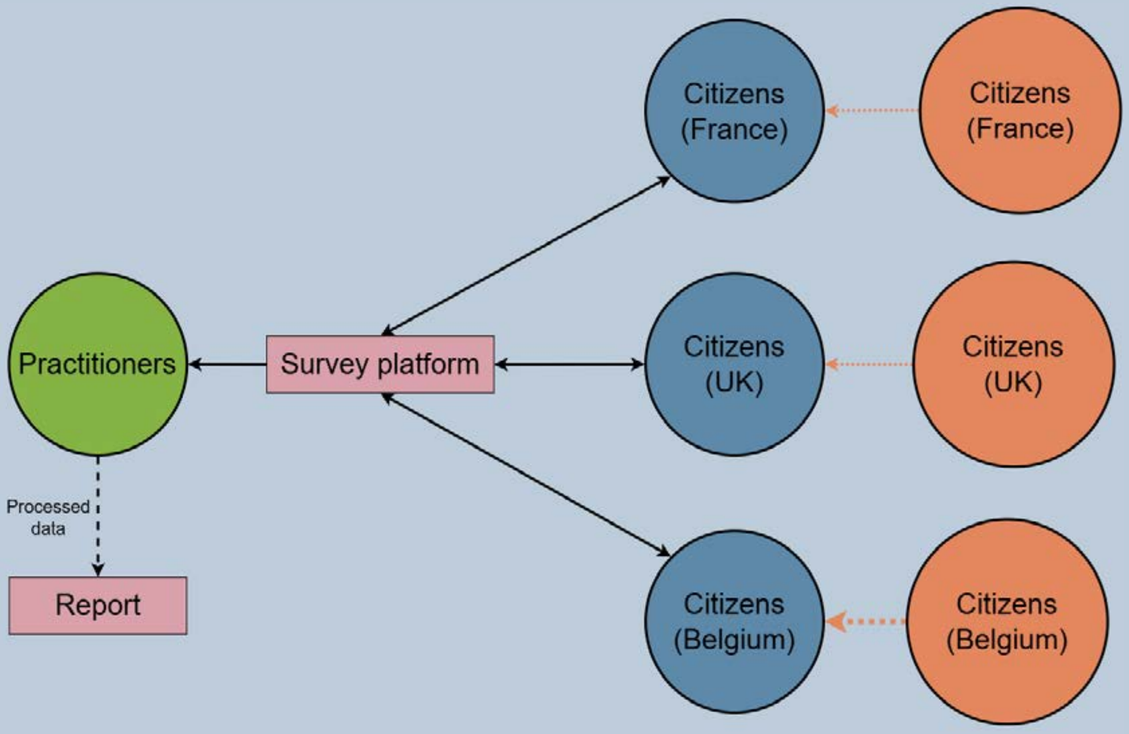
Discover an application example of the model

Model visualization - Healthy Data Project example

Go back to the model presentation

The Healthy Data Project case describes a public e-consultation related to the reuse of citizen health data. The consultation focused primarily on France, Belgium and the UK. A common survey platform was used to gather all the contributions supported by a large-scale communication campaign.

Representing the initiative using the model highlights the **significance of the platform** as a single point of interaction, as well as **weaker participation in UK and France**. Each element of the model can be used as a basis of reflection.



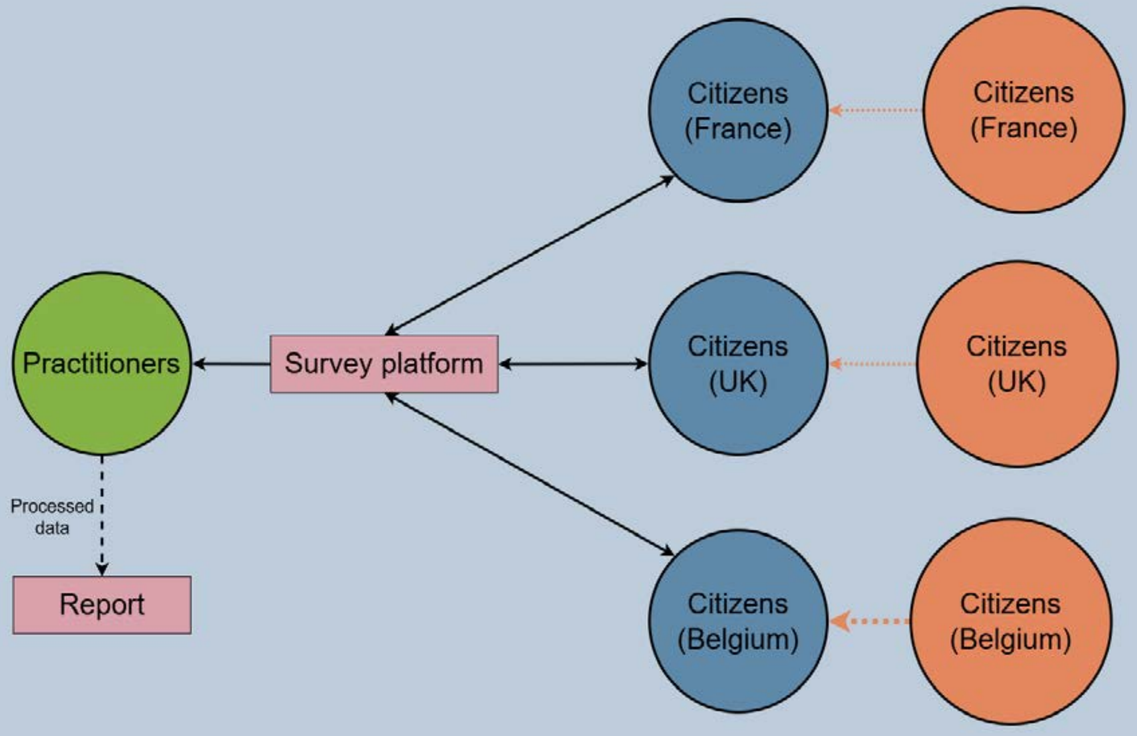
Discover possible changes to the initiative

Model visualization - Healthy Data Project example

Go back to the case description

Manual processing
Data from three countries can be voluminous. If data cannot be processed manually, consider using automated data processing techniques as complement to manual work

Weak representation (i.e., fewer responses)
Consider combining with social media if quantity of responses is more important, or interviews to favor quality



Lack of output clarity
Survey-type co-creation often lacks output clarity. Consider communicating the report to citizens through the platform so that they understand what is done with the survey data

Discover the modeled changed initiative

Model visualization - Healthy Data Project example

Go back to the case description

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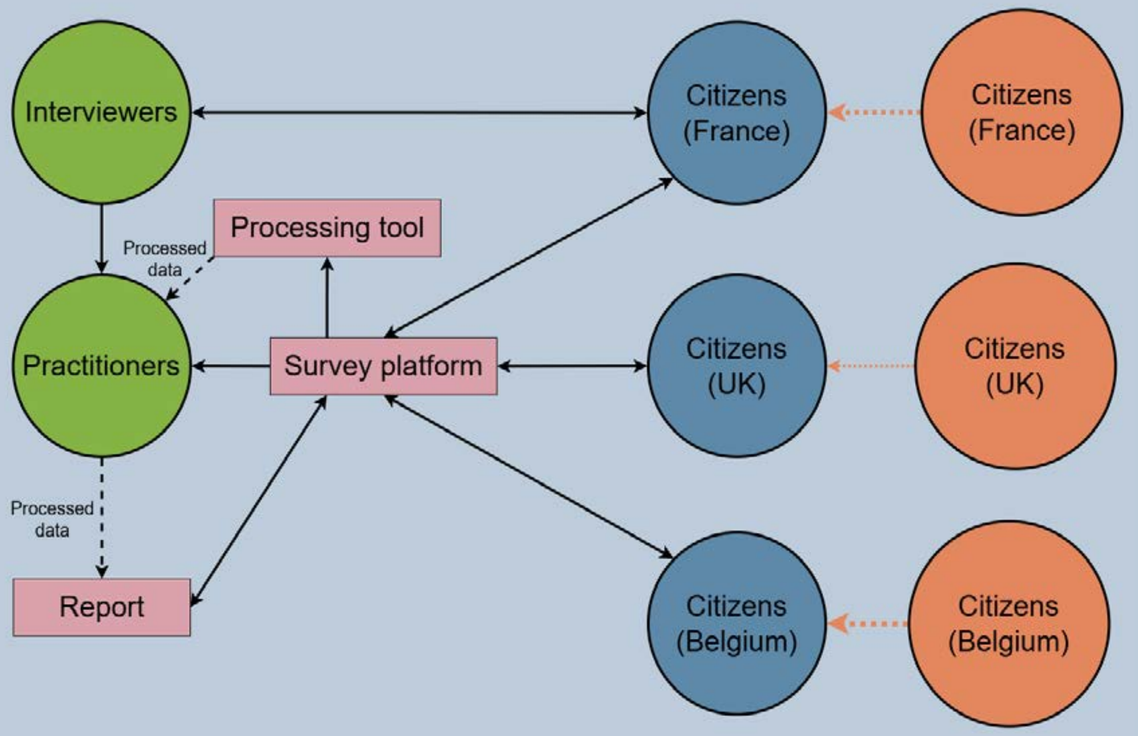

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Lack of output clarity
Survey-type co-creation often lacks output clarity. Consider **communicating the report to citizens through the platform** so that they understand what is done with the survey data

Explore the interview method

Explore the online survey method

More about data processing tools

Outcomes for digital co-creation

Carrying a co-creation initiative can lead to many different outcomes at various levels. You can click on one of the three following types of outcomes to find out more.

Product outcomes

What are the goals of the co-creation initiative?

Process outcomes

What is the democratic quality of the co-creation initiative?

Institutional outcomes

What are the side-effects of the co-creation initiative?

These outcomes can be observed at the level of individual citizens or the co-creation initiative as a whole. This toolkit focuses on the initiative level, but you can use the outcomes list as a guide when asking participants to evaluate their experience in the co-creation initiative.

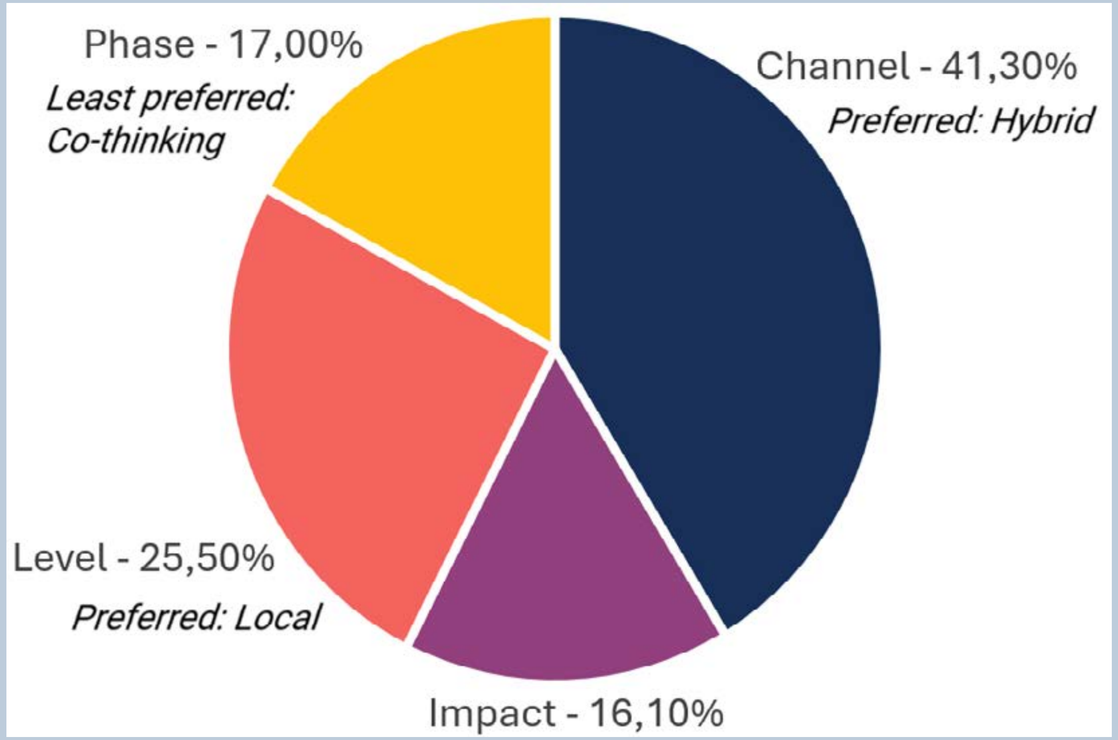
Jump to our key recommendations

Willingness of citizens to participate in co-creation

Citizens' willingness to engage in co-creation varies significantly based on contextual attributes, including channel type, level of governance, and phase of the process. **More than 40% of the variation is explained by the channel type.**

Channel	*Use of technology in the communication with citizens*
Impact	*Degree to which the co-creation organizer is constrained by the inputs of participating citizens*
Level	*Level of government on which the co-creation organizer operates*
Phase	*Action performed by the participating citizens*

Find out how to improve the inclusivess of underrepresented groups



Improving the inclusiveness of citizens in co-creation

Some groups of citizens are usually underrepresented in co-creation initiatives. This is for example the case of citizens with low eductation, low motivation to participate, and low political interest.

Inclusiveness is one of the process outcomes, which is the type of co-creation outcomes considered most important by citizens.

Low education	*No preference for any channel type*
Low motivation	*Preference for digital co-creation* *Less strong preference for the local level*
Low political interest	*Preference for digital co-creation*

Analog co-creation is promising for citizens with low education, since others tend to prefer hybrid formats

Citizens with low motivation and political interest are best involved if they can participate remotely

Explore the preferences of the general population (based on 1,000+ citizens)

Discover other process outcomes

Product outcomes

Product outcomes are derived from production-oriented logic by emphasizing the attainment of direct goals through an efficient and effective process. The product outcomes can also be described as the pre-determined goals of co-creation.

Effectiveness	*Have the shared objectives or goals been achieved?*
Efficiency	*Has the initiative led to an efficient or cost-saving solution?*
Innovation	*Has the initiative introduced new ideas, solutions, or methods that can be applied by policymakers?*

Focus on these in a solution-oriented initiative

Learning	*Did the initiative contribute to policymakers learning about participants' needs?*
Personalization	*Did the initiative contribute to a solution that better fits the wants and needs of different groups?*
Satisfaction	*Did the initiative contribute to satisfaction on the policy issue among participants?*

Focus on these in a citizen-oriented initiative

Explore process outcomes

Process outcomes

Process outcomes, which help protect values such as fairness, honesty, and mutuality. How a process is organized and experienced are, beyond outcomes in itself, also sometimes conditions for effective product and institutional outcomes. **Process outcomes are considered the most important for citizens.**

Conflict resolution	*Have mechanisms been put in place to resolve conflicts during the process?*
Democratic accountability	*Were decisions made democratically by users?*
Inclusiveness	*Have mechanisms been put in place to ensure all relevant participants were involved?*
Legitimacy	*Were the digital tools and methods used considered legitimate?*
Resource integration	*Were the resources of participants integrated effectively?*
Transparency	*Have mechanisms been put in place to provide participants with information about the digital process?*

Find out how to improve the inclusivess of underrepresented groups

The most important of all outcomes for citizens!

Explore institutional outcomes

Institutional outcomes

Institutional outcomes are tied to the resilience and robustness of the system in which co-creation takes place. By affecting the beliefs and behavior of participating users during and after co-creation, the institutional outcomes can also be described as long-term effects or byproducts.

Empowerment	*Has the initiative enhanced users' ability to defend their interests against the government?*
Litigation avoidanceability	*Have mechanisms been put in place to avoid litigation between users and stakeholders?*
Reputation	*Has the organization of the initiative improved the reputation of the government?*
Social cohesion	*Have mechanisms been put in place to create a sense of commonality in the initiative?*
Solution ownership	*Have users been informed about who owns the solutions and their implementation?*
Trust	*Has the level of trust in the policy issue improved?*

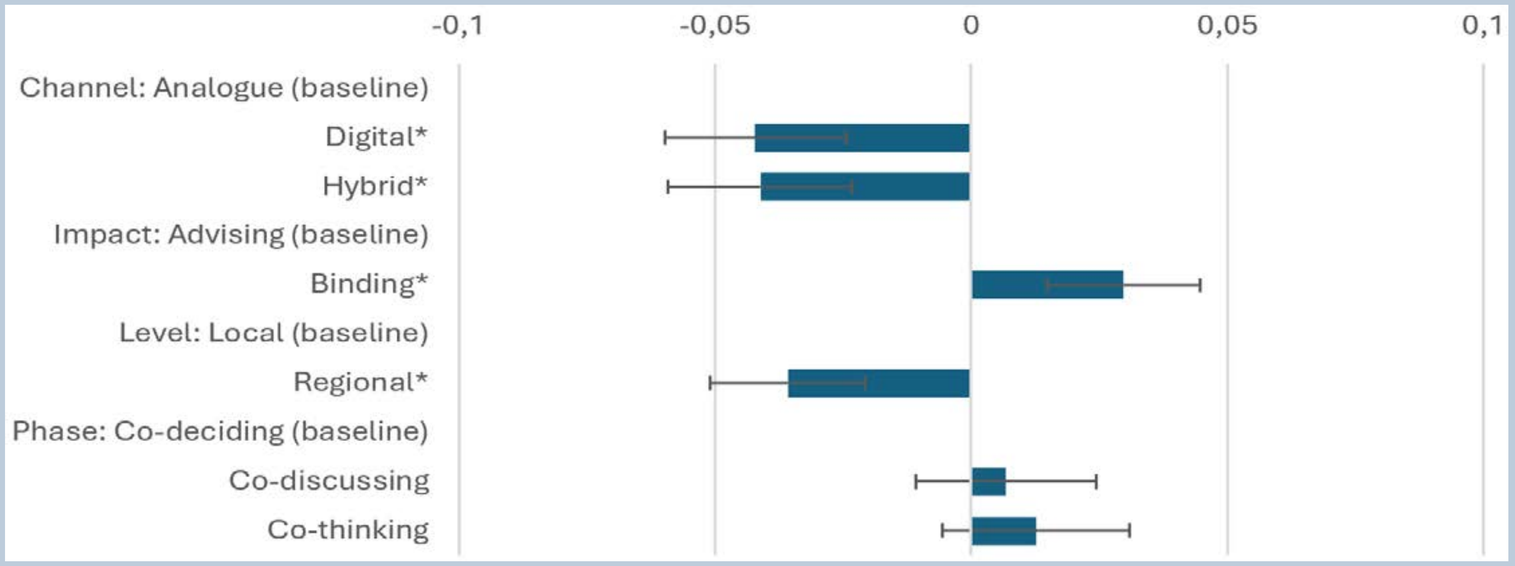
Changing characteristics of the design of the co-creation initiative will affect outcomes, and <u>especially institutional outcomes</u>

Find out which co-creation design leads to better trust

Designing co-creation leading to better trust

Attributes of co-creation initiatives affect citizens' willingness to participate but also the extend to which they believe that it will lead to a higher level of trust. The graph belvow shows significant (*) differences across multiple attributes. We observe that analogue and binding co-creation organized at the local level is perceived to lead to a higher level of trust compared to alternative designs.

Interestingly, the designs perceived as achieving the highest level of trust are not those citizens are the most willing to participate in.



This does not mean that co-creation should only be analogue, binding, and local, rather that such designs should be preferred if trust is a priority outcome

Discover how these attributes affect citizens' willingness to participate

Jump to our key recommendations

Key recommendations

Based on the analysis of outcomes and our studies on citizens' perception of these outcomes and their preferences on the design of co-creation initiatives, we propose 3 key recommendations.

Prioritize decentralized participation models	*Local initiatives were consistently rated higher by citizens. This should encourage practitioners to prioritize decentralized participation models, where citizens feel a stronger sense of ownership and influence over policy decisions.*
Go for analogue and binding models to favor institutional outcomes	*For long term effects and changes in beliefs amongst citizens, it is most effective to organize in-person (analogue) and binding co-creation initiatives.*
Define intended outcomes upstream	*There is a need for mapping intended outcomes prior to organizing a co-creation initiative and choosing attributes depending on these. This strategic alignment can help practitioners to better tailor their initiatives to meet the specific goals of their co-creation efforts.*

Discover the data that led to these recommendations

Corona Consultations

The Corona Consultations implied a **three-phase co-creation initiative** carried out and coordinated by Sciensano between November 2020 and January 2021 at the request of then Minister of Health and Social Affairs, Frank Vandenbroucke and his cabinet.

The initial question was whether the organization was interested and still had the capacity to organize citizen participation around COVID-19 vaccinations within the left-over margins of the Ministery allocated Cancerplan budget. The initiative's co-decided objective was to inform vaccination policy and lay out a vaccination strategy accepted and supported by the Belgian citizenry.

Link to project

Corona Consultations

- Demand
- Demand and support
- Support
- Support and participation
- Participation
- Participation and demand
- Fully immersed

- (semi-)Governmental actor
- Citizen(s)
- Private sector actor
- Academia and research
- Non-profit actors

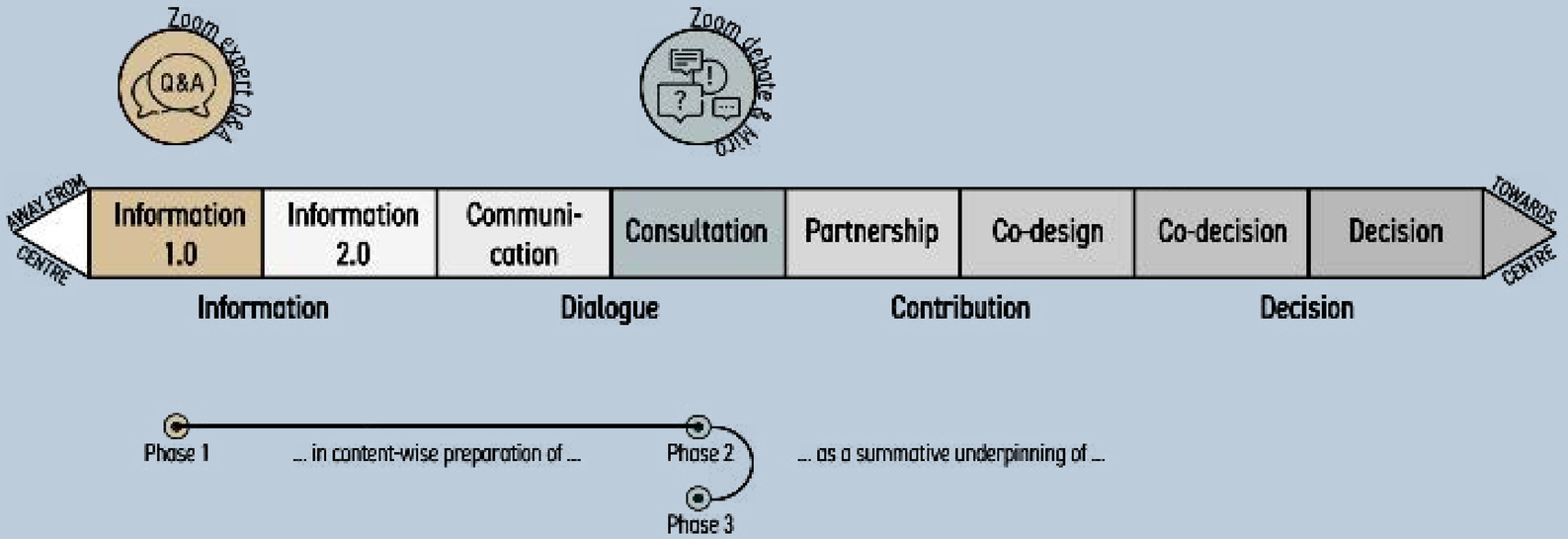
Corona Consultations

Ten debating moments (5 Dutch-speaking and 5 French-speaking of approx. two hours) about COVID-19 vaccination were organized on the same pattern. They included a deliberate outtake of citizens (i.e., circle) that were selected based on age, gender, language spoken at home, educational attainment and (un)willingness to get vaccinated in order to guarantee diverse opinions and capture a multitude of societal concerns.

In total, 103 citizens were recruited from a sample of 5,802 citizens who had completed a COVID-19 Health questionnaire by Sciensano in the past and had indicated a willingness to debate COVID-19 policy.

Corona Consultations

In **Phase 1**, information and Q&A opportunities were provided by experts in pharmacology, immunology, medicine and virology (i.e., triangle) to prepare citizens for the debate in **Phase 2**. In **Phase 2**, and through moderation, citizens discussed the desirability of (a) mandatory vaccination and (b) the exclusion of citizens based on their vaccination status.
Although they did not partake as such, experts remained present throughout the debates as fact-checkers—a purely supportive function. The results of these discussions were briefly summarised and presented directly to the minister and his cabinet members in a **third and final phase**.



Corona Consultations

Corona Consultation results were purely advisory and held no binding consequences. All phases were organised online and supported through Miro-boards.

During the final presentation in **phase 3**, citizens could also ask pertinent questions directly to the minister. To do so, however, they first had to submit the questions using the chat function of the video conferencing tool. Other citizens could vote on the questions they found more or less relevant. Moreover, from the 5,802-headed recruitment sample, citizens who were not selected could submit a written answer to the two leading debate questions. However, as experts did not inform this group in a similar way, their responses were analysed separately.

CartoWeb.be and the Topomapviewer

A **co-assessment initiative** has been organized by the National Geographical Institute Belgium (NGI/ IGN) to keep their topographical base map(s) of Belgium as updated and high-quality as possible.

While the restitution of aerial photographs allows for the conversion of reality into accurate maps, it is not possible to permanently monitor the state of the entire Belgian territory. Hence, all those using the map through the web service (i.e., CartoWeb.be) or application (i.e., TopoMapViewer) can make a valuable contribution to its accuracy. To this end, since 2018, the TopoMapViewer has an incorporated functionality that allows every user to send a comment and report (a) issues with the application itself and (b) a discrepancy between the terrain in reality and what it should look like according to the map.

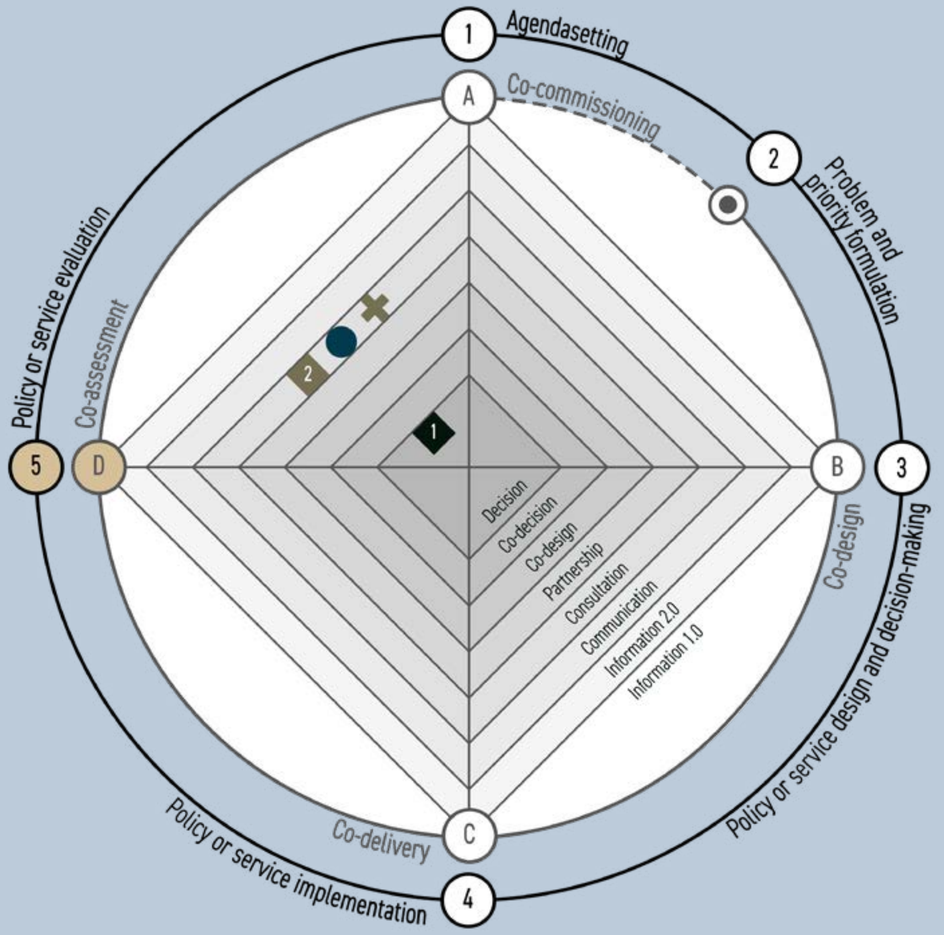
Co-creation, in this case, proceeds in **two phases**.

NGI Nationaal Geografisch Instituut

IGN Institut Géographique National

Link to project

CartoWeb.be and the Topomapviewer



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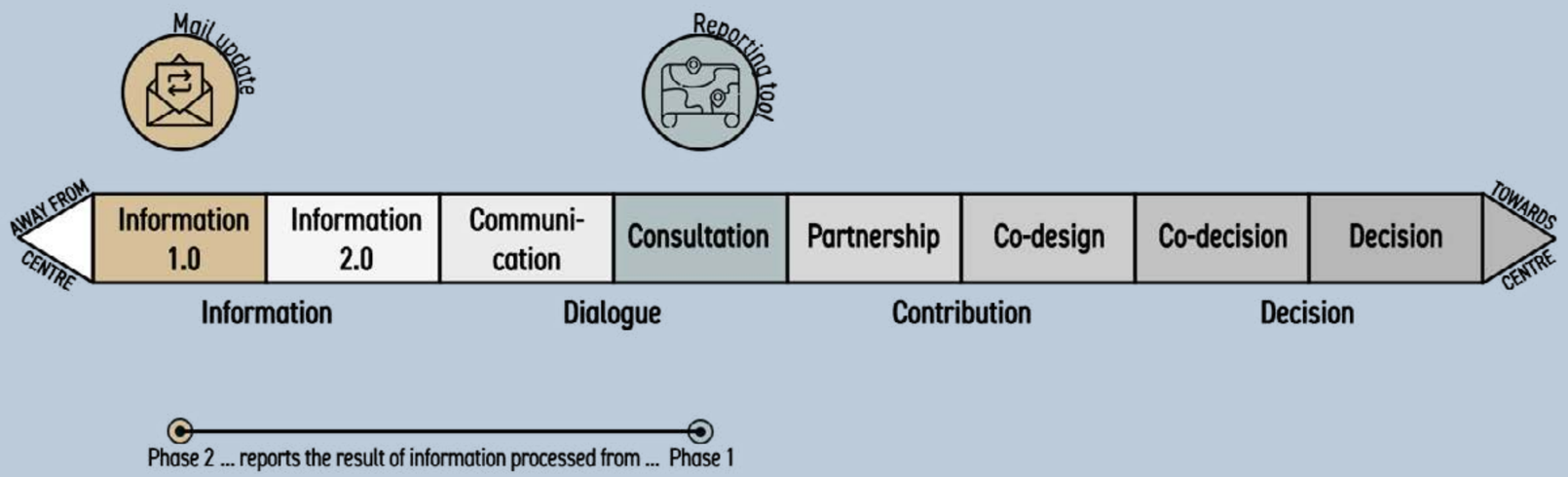
CartoWeb.be and the Topomapviewer

In the **first phase**, individual actors (e.g., citizens, firemen, local civil servants, teachers, scouts, hiking club members, etc.) who come across an error or missing element in the map can report this. NGI purposefully collects all these reports in a database awaiting analyses to keep its maps updated. With a lead time of two months, NGI's Production and Integration Department validates each entry. The Cartography Department also registers approved changes in the printed maps revisions system.

In the **second phase**, the notifier of the map error or discrepancy is updated per email—at least, if (s)he indicated a desire to be kept in the loop—(s)he is informed about whether or not and how the change has been implemented based on his or her reporting.



CartoWeb.be and the Topomapviewer

While anyone can provide feedback on discrepancies between the reality on the terrain and those on the map, NGI observes that these mainly come from own staff or (semi-)governmental and non-profit professionals, such as emergency services (fire brigades, police and the army), local government officials or civil servants and teachers on an excursion with their pupils. Whereas each of them individually is also a (Belgian) citizen, their stakes in this co-creation story differ substantially from those of ordinary citizens. For citizens, an updated and high-quality map constitutes a nice to have (e.g., when out and about exploring fields and forests).

On the contrary, for (semi-)governmental and non-profit professionals those maps imply a must have given the large amount of terrain information they require in the performance of their jobs. From that perspective, the demand for this initiative is two-fold. On the one hand, the feedback opportunity was installed at the request of the Belgian emergency services utilising the maps, as their service provision requires the most updated information on a particular terrain. On the other hand, NGI is perpetually in demand to continue offering the highest-quality maps possible.